

ASW-1210 Version 3.0
ASPI Manager for DOS
with ASPI Disk Module

Installation Guide



ASW-1210 Version 3.0 ASPI Manager for DOS with ASPI Disk Module

Installation Guide

Adaptec
Lithuania Department - MS40
601 South Milpitas Blvd.
Milpitas, CA 95035
1-800-834-3788

Copyright

© Copyright 1992 Adaptec, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means; electronic, mechanical, photocopying, recording or otherwise, without the prior written consent of Adaptec, Inc., 691 South Milpitas Blvd., Milpitas, CA 95035.

Trademarks

386 and 486 are trademarks of Intel Corporation.

ASPI is a trademark of Adaptec, Inc.

COMPAQ is a registered trademark of Compaq Computer Corp.

IBM is a registered trademark and PC/AT is a trademark of International Business Machines Corporation.

MS-DOS, MS, and Microsoft are registered trademarks and Windows is a trademark of Microsoft Corporation.

Qualitas and 386Max are trademarks of Qualitas, Inc.

QEMM-386 is a trademark of Quarterdeck Office Systems.

SYTOS and Sytos Plus are registered trademarks of Sytron Corporation.

Changes

The material in this manual is for information only and is subject to change without notice.

Adaptec reserves the right to make changes in the product design without reservation and without notification to its users.

Literature

The Adaptec Literature Department can be reached at 1-800-934-2766. In addition to this software Installation Guide, a host adapter User's Manual and Technical Reference Manual are also available.

Additional information may be obtained from:

adaptec

Literature Department - MS/40
691 South Milpitas Blvd.
Milpitas, CA 95035
1-800-934-2766

Technical Support

There are several ways to get technical assistance for your Adaptec product(s). Each is described below. When requesting assistance, be sure that you have the following items available (or if you write or FAX, send them along):

- the model of any Adaptec hardware product(s) you have.
- the model and version number of any Adaptec software product(s) you are using.
- the type and version number of operating system you are using.
- the place at which you purchased your Adaptec product.

If you received your Adaptec host adapter as original equipment in a computer system, first contact that computer manufacturer for technical assistance.

If you are an OEM, contact your local Adaptec sales office.

If you wish to contact Adaptec by telephone directly, our technical support phone number is: (408) 945-2550.

Outside of the US and Canada, contact your local authorized Adaptec distributor.

The Adaptec electronic Bulletin Board Service (BBS) is available 24 hours a day at (408) 945-7727. You can connect at 1200, 2400 or 9600 baud, using 8 data bits, 1 stop bit and no parity. Questions may be posted to the system operator (sysop). In addition, user manuals, utility programs, and other information are also available on line through the BBS.

You can write to:

adaptec

Technical Support
691 South Milpitas Blvd.
Milpitas, CA 95035

If you would prefer to contact us by FAX, our number is (408) 262-2533.

Table of Contents

Preface	viii
Conventions	ix

Chapter One Introduction

About this Manual	1-1
Contents of the Package	1-1
Contents of the Distribution Diskette.....	1-2
The ASPI DOS Manager: aspi2dos.sys	1-2
The Disk Module: aspidisk.sys	1-3
Formatting and Partitioning a SCSI Disk with afdisk.exe...	1-4
About ASPI	1-5

Chapter Two Software Installation

About This Chapter.....	2-1
Installing aspi2dos.sys Under DOS	2-1
On-Screen Messages from aspi2dos.sys	2-2
Suppressing Loading of aspi2dos.sys	2-3
aspi2dos.sys Command Line Options.....	2-4
Content of a Sample config.sys File	2-10
Installing aspidisk.sys Under DOS.....	2-10
aspidisk Command Line Options.....	2-11
On-Screen Messages from aspidisk.sys	2-13

Chapter Three Formatting and Partitioning Using afdisk.exe

About this Chapter.....	3-1
Installing afdisk.exe on your Hard Disk.....	3-1
afdisk.exe On-Line Help	3-2
Partitioning Your Drive Using afdisk.exe	3-2

Chapter Four Software Considerations

About this Chapter.....	4-1
Loading ASPI Software in High Memory	4-1
Sample config.sys which Loads aspi2dos.sys High	4-1
Using ASPI Software with Windows 3.1.....	4-2

Chapter Five Using Multiple Host Adapters

About this Chapter	5-1
Using Multiple Host Adapters.....	5-1
Using Multiple AHA-1510 Host Adapters	5-2
Sample config.sys File for Multiple AHA-1510 Host Adapters	5-2
Using Multiple AHA-1520/1522 Host Adapters	5-3
Sample config.sys File for Multiple AHA-1520/1522 Host Adapters	5-3
Multiple Host Adapters and BIOS Disabling	5-4
Using an AHA-1510/1520/1522 and an AHA-1540/1542 Host Adapter	5-4
Mixing aspi2dos.sys with Other ASPI Managers.....	5-4

Chapter Six Commonly Asked Questions

About this Chapter.....	6-1
-------------------------	-----

Chapter Seven Error Messages

About this Chapter.....	7-1
aspi2dos.sys Error Messages.....	7-1
aspidisk.sys Error Messages	7-3

Appendix A Glossary

Glossary of Terms	A-1
-------------------------	-----

Index

.....	Index-1
-------	---------

List of Figures

Figure 1-1. ASPI-Based System Software Architecture	1-6
Figure 2-1. aspi2dos Screen Messages without /d Switch	2-2
Figure 2-2. aspi2dos Screen Messages with /d Switch.....	2-3
Figure 2-3. Message if aspi2dos Loading is Suppressed.....	2-4
Figure 2-4. aspi2dos Messages from /pause Switch	2-9
Figure 2-5. aspidisk Screen Messages without /d Switch...	2-13
Figure 2-6. aspidisk Screen Messages with /d Switch	2-14
Figure 3-1. Mounted SCSI Drives Found by afdisk	3-3
Figure 3-2. afdisk Screen After Selecting a Drive	3-4
Figure 3-3. afdisk Create Partition Screen.....	3-5
Figure 3-4. afdisk Confirm Partition Creation Screen.....	3-6
Figure 3-5. afdisk Display Existing Partitions Screen.....	3-6
Figure 3-6. afdisk Warning for BIOS-Controlled Drives	3-7
Figure 3-7. afdisk Exit Screen when Partitions Changed	3-8

Preface

This manual provides installation and configuration information for Adaptec's Advanced SCSI Programming Interface (ASPI™) DOS™ Manager. This Manager is used with Adaptec's AHA-1510 and AHA-1520/1522 host adapters and with the AIC-6260 SCSI protocol chip.

Chapter One, *Introduction*, gives general information about the ASW-1210 and a list of files provided on the Distribution diskette.

Chapter Two, *Software Installation*, describes how to install each of the programs supplied, with the exception of *afdisk.exe*. This latter program is described in Chapter Three.

Chapter Three, *Formatting and Partitioning Using afdisk.exe*, describes how to install and operate *afdisk.exe*. This program partitions and high-level formats SCSI disks.

Chapter Four, *Software Considerations*, provides tips for using the ASW-1210 software with various other programs you may already own or may purchase in the future.

Chapter Five, *Using Multiple Host Adapters*, explains how to install ASW-1210 software when more than one SCSI host adapter card is installed in your computer.

Chapter Six, *Commonly Asked Questions*, provides answers to questions which often arise when installing or using ASW-1210 programs.

Chapter Seven, *Error Messages*, provides alphabetical lists of on-screen messages which appear when a problem is encountered by the software.

Conventions

The following typographic conventions are used throughout this Installation Guide.

bold

Used for keystrokes (.. press the **Enter** key ..) and screen selection fields (.. select **Backup Device** and ..).

Helvetica

Used for operator entry that must be typed exactly as shown (.. **device=c:\cdrom\cdrom.tsd** ..) and for screen messages (.. Enter Password ..).

Helvetica Italics

Used as a place holder for text you must determine and type in (.. enter *nn* for number ..). Also used for program and file names in body text (.. the *autoexec.bat* file ..).

Italics

Used for emphasis (.. is *only* supported ..) and document reference (.. refer to Chapter 2, *Installation* ..).

ALL CAPITALS

Used for acronyms, such as SCSI.

Hexadecimal Numbers

Are followed with an 'h', e.g., 330h.

The □ symbol marks the end of text for each chapter.



Chapter One

Introduction

About this Manual

This manual provides installation and configuration information for Adaptec's Advanced SCSI Programming Interface (ASPI) DOS Manager. This software is used with the following:

AHA-1510	host adapter
AHA-1520/1522	host adapters
AIC-6260	SCSI protocol chip

Also described in this manual are the ASPI disk driver *aspidisk.sys*, and the SCSI hard disk partitioning program *afdisk.exe*. Together with the ASPI DOS Manager, these provide full support for a variety of media including fixed disk, magneto-optical disk and removable disk. With the addition of third-party software, tape and CD-ROM can be supported.

The DOS versions supported are MS[®] and IBM[®] 3.30, Compaq[®] 3.31, MS or IBM 4.0x, and MS 5.0.

Contents of the Package

The package you received when purchasing the ASW-1210 should contain:

- The *ASW-1210 Version 3.0 ASPI Manager for DOS Installation Guide* (this manual).
- A Distribution diskette containing the software titled *ASW-1210, ASPI Interface for DOS Version 3.0*.

If any items are missing, contact your dealer or distributor.

Contents of the Distribution Diskette

The Distribution diskette contains the following files:

<i>aspi2dos.sys</i>	ASPI DOS Manager
<i>aspidisk.sys</i>	DOS disk driver
<i>afdisk.exe</i>	SCSI disk partition and format utility
<i>afdisk.cwa</i>	<i>afdisk.exe</i> system file
<i>afdisk.hlp</i>	<i>afdisk.exe</i> help file
<i>readme.txt</i>	Latest information regarding this package (optional).

The purpose of each of these files is described below.

The ASPI DOS Manager: *aspi2dos.sys*

The ASPI DOS Manager included with the ASW-1210 is *aspi2dos.sys*. The *aspi2dos.sys* manager is used with the AHA-1510 and 1520/1522 Host Adapters, and with the AIC-6260 SCSI Protocol Chip.

The DOS operating system uses the ASPI DOS Manager to communicate with the SCSI host adapter and allow access to additional SCSI devices connected to that host adapter. The ASPI DOS Manager is typically used:

- When more than two hard disk drives are installed, because only two hard disks can be controlled via the host adapter BIOS. Note that the driver *aspidisk.sys* is also required when more than two hard disks are present.
- When more than one host adapter is installed.

- To install a SCSI drive that is configured at a SCSI ID other than 0 or 1. The host adapter BIOS requires the use of SCSI IDs 0 and/or 1 for disk drives it manages. *aspidisk.sys* is also required for such a configuration.
- To install removable media. Once again, *aspidisk.sys* is required because the host adapter BIOS cannot handle such disks without risk of data loss.
- When interfacing to ASPI modules that control devices such as SCSI tape drives, CD ROMs, removable media, printers, plotters, and other SCSI devices.
- To change the host adapter configuration (AHA-1510 and AIC-6260 only). The command line options used to do this are described in Chapter Two, *Software Installation*.
- To increase performance.

The Disk Module: *aspidisk.sys*

aspidisk.sys is used to install any valid DOS partitions on SCSI disk drives that are not managed by the host adapter BIOS. A drive will not be managed by the host adapter BIOS if:

- No host adapter BIOS is present (AHA-1510 only).
- The host adapter BIOS is disabled.
- Two hard disk drives are already installed.
- The SCSI ID is something other than 0 or 1.

Valid DOS partitions to be mounted and accessed using *aspidisk.sys* can be created with either DOS's *fdisk.exe* or Adaptec's *afdisk.exe*. Only media with 512 Bytes/sector is supported by *aspidisk.sys*.

Removable media hard disks are a special case. These should only be controlled by *aspidisk.sys*, not with the host adapter BIOS.

WARNING

If a removable media hard disk is mounted under the host adapter BIOS, do not change the media or unpredictable results may occur and data may be lost! To avoid such problems, change the SCSI ID of the removable media drive to 2, 3, 4, 5, or 6 and use *afdisk.exe* to format and partition the drive and *aspidisk.sys* to control the drive.

The *aspidisk.sys* driver is not loaded into memory if no *afdisk* or DOS partitions are found when your computer is booted. If a removable media hard disk is found and not mounted under host adapter BIOS control, *aspidisk.sys* is loaded into memory and will, by default, reserve one DOS logical drive per removable fixed disk drive.

If only a total of two or less hard drives are in the system (e.g., two standard hard disks, one standard hard disk and one SCSI hard disk, or two SCSI hard disks), *aspidisk.sys* is not needed. In this case, a *device=aspidisk.sys* line can still be present in the *config.sys* file (for use later if you add a disk) because the driver will not install and take up memory unless valid partitions are found. Do not be concerned that *aspidisk.sys* does not load when no valid partitions exist.

Formatting and Partitioning a SCSI Disk with *afdisk.exe*

afdisk.exe is an Adaptec SCSI disk partitioning and high-level formatting utility. SCSI disks not installed under the host adapter BIOS can be partitioned with *afdisk.exe*. *afdisk.exe* will allow you to add or delete a DOS partition or delete a non-DOS partition. Note that low-level formatting is not required for SCSI disks; this operation occurs at the factory.

Adaptec recommends that you do a high-level format using the DOS *format* command so that DOS can verify the media for you.

afdisk.exe partitions are mounted when you boot your machine with the *aspidisk.sys* driver. Partitions created with *afdisk.exe* are completely compatible with DOS partitions. In other words, partitions created with DOS *fdisk.exe* can later be mounted by and accessed with the *aspidisk.sys* driver. Also, partitions created by *afdisk.exe* can be moved to control of the host adapter BIOS. Partitions moved to host adapter BIOS control are bootable if they were previously high-level formatted so as to contain the system files (e.g., using the */s* option of DOS *format.com*). In order for a SCSI disk to be bootable, the DOS version used must be 3.3 or later.

About ASPI

aspi2dos.sys and *aspidisk.sys* make use of the Advanced SCSI Programming Interface or ASPI. This consistent, standardized interface represents a modular approach to SCSI device drivers. The architecture of this approach is depicted in Figure 1-1.

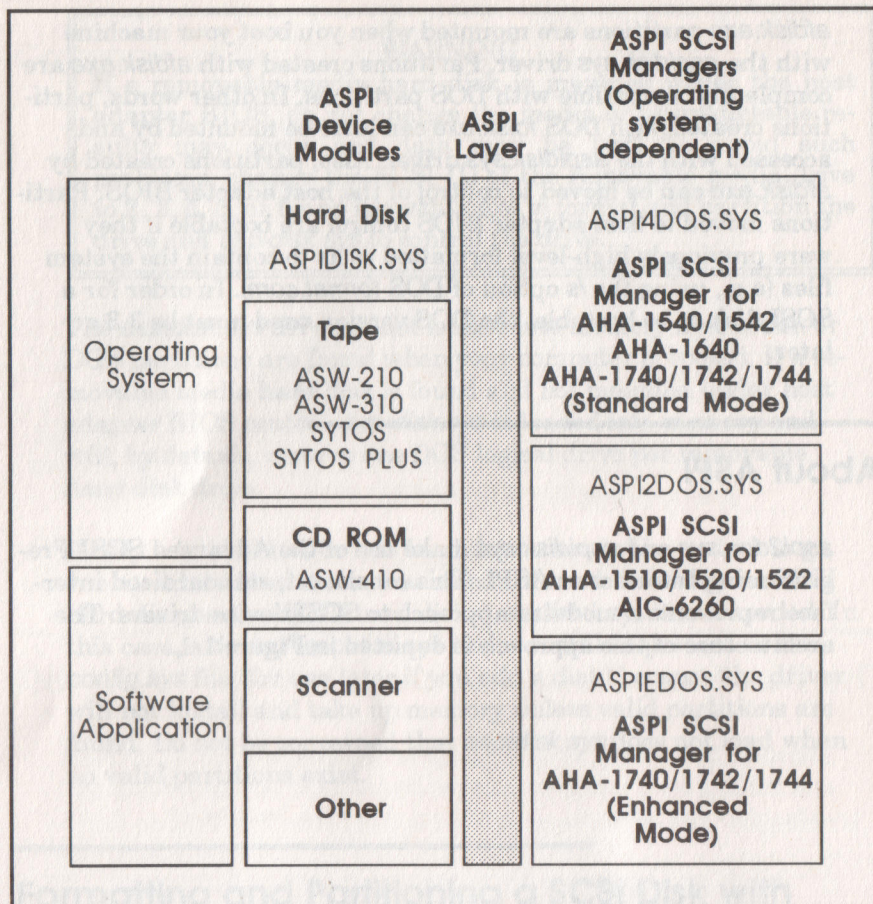


Figure 1-1. ASPI-Based System Software Architecture

Device drivers (ASPI Device Modules) use the ASPI interface instead of directly reading from or writing to the host adapter hardware. The advantage of this approach is that changes in hardware (such as the host adapter) do not affect the device module. This makes it more economical for developers to create products and easier for users to install and operate them.



Chapter Two

Software Installation

About This Chapter

This chapter describes the steps you will take when installing programs supplied on the Distribution diskette. It covers copying files to your system hard disk, modifying your *config.sys* and *autoexec.bat* files, and the command line options for *aspi2dos.sys* and *aspidisk.sys*. Operation of *afdisk.exe* is covered in Chapter Three, *Formatting and Partitioning Using afdisk.exe*.

Installing aspi2dos.sys Under DOS

The *aspi2dos.sys* Manager is only used with the following:

AHA-1510	host adapter
AHA-1520/1522	host adapters
AIC-6260	SCSI protocol chip

To install *aspi2dos.sys*, follow the steps below:

1. Copy *aspi2dos.sys* to the hard disk from which you will boot the system. This is usually drive C.
2. Using an ASCII file editor, place the following line in your *config.sys* file:

```
device=[path]aspi2dos.sys [optional switches]
```

where:

[path] is the full pathname of the directory in which *aspi2dos.sys* is located. For example *c:\drivers* might be

used if *aspi2dos.sys* was located in this directory. Note that there should be no space between the trailing slash and *aspi2dos.sys*, in other words

```
device=c:\drivers\aspi2dos.sys.
```

[optional switches] are command line switches used to tailor the operation of *aspi2dos.sys* to your computer. These are described in detail below in the *aspi2dos Command Line Options* section.

The *device=aspi2dos.sys* line in your *config.sys* file should precede other *device=* lines used to load ASPI modules (such as *aspidisk.sys*) and any disk caching drivers (such as *smartdrv.sys* or *smartdrv.exe*). See the *Content of a Sample config.sys File* section below for more details.

- Using an ASCII file editor, add any other device driver commands to your *config.sys* file. For instance if you will be using *aspidisk.sys*, you will need to add a *device=aspidisk.sys* line to *config.sys*.
- Reboot your computer so the ASPI DOS Manager is installed in memory.

On-Screen Messages from aspi2dos.sys

When *aspi2dos.sys* is loaded into memory, it displays an on-screen message. This message varies based on whether or not the */d* command line switch is specified in the *device=aspi2dos.sys* line in your *config.sys* file. If the */d* switch is not used, the message depicted in Figure 2-1 will appear.

```
AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.
```

```
Int 13H routed through ASPI manager.
ASPI2DOS.SYS Installation Successful
```

Figure 2-1. *aspi2dos* Screen Messages without */d* Switch

If the */d* command line option is specified (i.e., the line *device=aspi2dos /d* is in *config.sys*), the on-screen messages at boot time will be as shown in Figure 2-2.

```
AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.
```

Host Adapter #:	0	Host Adapter SCSI ID:	7
I/O Port Address:	340	DMA Channel:	0
Interrupt Level:	11	Transfer Mode:	PIO
Disconnection:	Enabled	Parity Checking:	Enabled
Sync Negotiation:	Enabled	LUN Support:	Disabled

Host Adapter #0 - SCSI ID 0 - LUN 0:	QUANTUM	LP105S	910109405	2.8
Host Adapter #0 - SCSI ID 1 - LUN 0:	HP	97544T:	332	9049
Host Adapter #0 - SCSI ID 2 - LUN 0:	IOmega	BETA44		1.6
Host Adapter #0 - SCSI ID 6 - LUN 0:	ARCHIVE	VIPER 150	21247	-011

```
Int 13H active for Drive C: and D:
```

```
Int 13H routed through ASPI manager.
ASPI2DOS.SYS Installation Successful
```

Figure 2-2. *aspi2dos* Screen Messages with */d* Switch

Suppressing Loading of aspi2dos.sys

Placing *aspi2dos.sys* in your *config.sys* file may cause your machine to lock up when it is booted. To fix this problem, you must either boot from an appropriate floppy, fix the *config.sys* configuration and then re-boot from the hard disk, or you must suppress the loading of *aspi2dos.sys* when you boot from the hard disk. Adaptec provides this latter capability.

If you hold down both **Shift** keys on the keyboard after the computer runs its self-test (otherwise you will get a keyboard error), *aspi2dos.sys* will not load. This will permit you to boot the system and remove or alter the *device=aspi2dos.sys* line in your *config.sys* file. The message depicted in Figure 2-3 will appear when you suppress loading.

AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
 Version 3.0
 Copyright 1992 Adaptec, Inc.

Driver load aborted by user

Press any key to continue

Figure 2-3. Message if aspi2dos Loading is Suppressed

aspi2dos.sys Command Line Options

The full syntax of the `device=aspi2dos.sys` line in your `config.sys` file is:

`device=[path]aspi2dos.sys [/Group 1 options] [/Group 2 options]`

In general:

- All command line switches are optional.
- Each command line option is preceded by a forward slash.
- Command line options are not case sensitive (either lower or upper case can be used).
- Command line options are not white space sensitive (one or multiple spaces can separate them).
- `aspi2dos.sys` command line switches have been organized into two groups: Group 1 and Group 2.
- Group 1 options are mandatory for systems without configuration hardware readable by the AIC-6260, such as the AHA-1510. They are not valid for the AHA-1520/1522.
- Group 1 options override the host adapter jumper setting except for `/qx`, the Interrupt Channel selection.
- Group 2 switches are optional for all systems.

Definitions of Group 1 Command Line Options

The meaning of each Group 1 option is as follows:

`/c`

Specifying this option prevents SCSI targets from disconnecting during command execution. When this option is specified, the `/c-` option (the default) must not be specified.

Example: `/c`

`/c-`

Specifying this option allows SCSI targets to disconnect during command execution. When this option is specified, the `/c` option must not be specified. If neither `/c` nor `/c-` is specified, `/c-` (the default) is assumed.

Example: `/c-`

`/hx`

This option allows specification of the host adapter SCSI ID. The single-digit decimal address is specified at the location indicated by `x`. Only the numbers 0 through 7 are valid. Any other values will be rejected, an error message will be displayed and the host adapter will default to the jumper setting. If no `/h` option is present, a default SCSI ID of 7 is used.

Example: `/h5`

`/qx`

This option allows specification of the host interrupt request channel. The single- or double-digit decimal value at the location indicated by `x` specifies the channel number. Only the numbers 9, 10, 11 and 12 are valid. Any other values will be rejected, an error message will be displayed and the host adapter will default to the jumper setting. The default value is 11.

Example: `/qx10`

/u Specifying this option enables the host adapter to initiate negotiation with the target for synchronous data transfer. When this option is specified, the **/u-** option must not be specified. If neither **/u** nor **/u-** is specified, **/u** (the default) is assumed.

Example: **/u**

/u- When this option is specified, the host adapter does not initiate negotiation with the target for synchronous data transfer, and defaults to asynchronous data transfers. The host adapter negotiates for synchronous data transfer if negotiation is initiated by a target device. When this option is specified, the **/u** option (the default) must not be specified.

Example: **/u-**

/y Specifying this option disables the checking of SCSI bus parity by the host adapter. When this option is specified, the **/y-** option must not be specified. If neither **/y** nor **/y-** is specified, **/y** (the default) is assumed.

Example: **/y**

/y- Specifying this option enables the checking of SCSI bus parity by the host adapter. When this option is specified, the **/y** option (the default) must not be specified.

Example: **/y-**

/z This option sets all Group 1 options to their default values. This provides a shortcut to specifying each Group 1 option individually. Entering **/z** on the command line is equivalent to entering **/c- /y /u /h7 /q11**. The default values specified by **/z** can be changed by including Group 1 options on the same command line with **/z**. For example, **/z /h5** specifies the default configuration, except for the SCSI ID, which is 5 instead of 7.

Example: **/z**

Definitions of Group 2 Command Line Options

The meaning of each Group 2 option (switch) is as follows:

/b Specifying this option tells *aspi2dos.sys* how to proceed when a SCSI target device returns a busy status. If placed on the command line, this option causes *aspi2dos.sys* to wait 350 milliseconds upon receipt of busy status and then try to access the device again. It will continue to try until the SCSI device which returned the busy status becomes available. When this option is specified, the **/b-** option must not be specified. If neither the **/b** nor the **/b-** option is specified, **/b-** (the default) will be assumed.

Example: **/b**

/b-

Specifying this option tells *aspi2dos.sys* how to proceed when a SCSI target device returns a busy status. If placed on the command line, this option causes *aspi2dos.sys* to notify the program which called it that a busy status was received from the addressed target device. *aspi2dos.sys* does not try to access the device again unless told to do so by the calling program. When this option is specified, the **/b** option must not be specified. If neither the **/b** nor the **/b-** option is specified, **/b-** (the default) will be assumed.

Example: **/b-**

/d

This option will display useful information about the host adapter and attached SCSI devices during boot (see earlier example).

Example: **/d**

/i

This option can be used to disable loading of the embedded Int 13 module. When specified, Int 13 calls are routed through the host adapter BIOS instead of the Int 13 code in *aspi2dos.sys* (only for SCSI disks installed with the host adapter BIOS). This option is for debugging purposes and should normally not be used.

Example: **/i**

/L

This option enables support for SCSI logical units other than zero. The driver can recognize all eight possible LUNs associated with each SCSI target device. If this option is not specified, *aspi2dos.sys* will only recognize LUN 0 for each SCSI target device.

Example: **/L**

/p<port address>

This option sets the hex I/O port address that the driver uses to communicate with the host adapter. This value is specified as three hex digits. Valid values are: 140h and 340h (default). Any other values are rejected, an error message is displayed, and the default port address of 340h is used.

Example: **/p140**

Note

The AHA-1510/1520/1522 I/O port selection jumper must match the address specified with this option. If the host adapter is jumpered to port 140h, **/p140** must be specified. Otherwise, the default port address of 340h is assumed.

/pause

This switch is used to ensure that you can read the screen message(s) displayed by *aspi2dos.sys* at boot time. When it is specified, you are prompted to press any key after *aspi2dos.sys* has been loaded so that the remainder of the booting process can take place. The screen message which appears is shown in Figure 2-4.

Example: **/pause**

```

AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
Version 3.0
Copyright 1992 Adaptec,, Inc.

```

```

Int 13H routed through ASPI manager.
ASPI2DOS.SYS Installation Successful.

```

```

Press any key to continue

```

Figure 2-4. *aspi2dos* Messages from **/pause** Switch

Content of a Sample config.sys File

The relative positions of the buffers and files commands shown in the example *config.sys* file below are not important. However, the memory manager (*himem.sys* in this example) should be loaded before the ASPI Manager (*aspi2dos.sys*), followed in order by the ASPI module (*aspidisk.sys*) and any cache drivers.

```
buffers=20
files=20
device=himem.sys
device=setver.exe
device=aspi2dos.sys
device=aspidisk.sys
device=smartdrv.sys
```

Note that *himem.sys* is not used if a memory manager such as QEMM-386™ or 386Max™ is to be installed.

Installing aspidisk.sys Under DOS

aspidisk.sys is loaded into memory at power on time using a line in the *config.sys* file.

In order for the *aspidisk.sys* driver to recognize logical drives partitioned with *afdisk.exe*, the *config.sys* file must contain the following *device=* commands:

```
device=[path]aspi2dos.sys [optional switches]
device=[path]aspidisk.sys [optional switches]
```

Note

For proper operation, the *device=aspidisk.sys* line must come after the *device=aspi2dos.sys* line in *config.sys*.

aspidisk Command Line Options

The full syntax of the *device=aspidisk.sys* line in your *config.sys* file is:

```
device=[path]aspidisk.sys [/d] [/pause] [/r<reserve count>]
```

In general:

- All command line switches are optional.
- Command line options are each preceded by a forward slash.
- Command line options are not case sensitive (either lower or upper case can be used).
- Command line options are not white space sensitive (one or multiple spaces can separate them).

The meaning of each switch is as follows:

/d	This option displays useful information about the host adapter and attached SCSI devices during boot (see example below). Example: /d
/pause	This switch is used to ensure that you can read the screen message(s) displayed by <i>aspidisk.sys</i> at boot time. If it is specified, you are prompted to press any key after <i>aspidisk.sys</i> has been loaded so that the remainder of the booting process can take place. Example: /pause

/r<reserve count> This option determines the number of DOS logical drives reserved for removable media. It is ignored if the only hard disk(s) installed are of the nonremovable type. If not specified, the default number of reserved logical drives is one. Valid values are 1 to 24 decimal.

This option ensures that sufficient logical drives are reserved for all removable cartridges that will be installed. For example, consider a system having a removable drive containing a cartridge with one logical drive on it. If the **/r** option is not used, only one logical drive is reserved. If a cartridge with two logical drives is subsequently inserted, the second logical drive cannot be accessed. The **/r** option prevents such a situation from occurring.

Example: **/r2**

On-Screen Messages from aspidisk.sys

When *aspidisk.sys* is loaded into memory, it displays an on-screen message. This message varies based on whether or not the **/d** command line switch is specified in the **device=aspidisk.sys** line in your *config.sys* file. If the **/d** switch is not used and *aspi2dos.sys* and *aspidisk.sys* are loaded, the message in Figure 2-5 appears.

```
AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.
```

```
Int 13H routed through ASPI manager.
ASPI2DOS.SYS Installation Successful
```

```
ASPI Disk Driver for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.
```

```
1 SCSI disk drive(s) handled by ASPIDISK
ASPIDISK.SYS Installation Successful
```

Figure 2-5. aspidisk Screen Messages without /d Switch

If the **/d** switch is used with both *aspi2dos.sys* and *aspidisk.sys* (i.e. *config.sys* contains both a **device=aspi2dos.sys /d** line and a **device=aspidisk.sys /d** line), the messages depicted in Figure 2-6 appear.

AHA-1510/1520/1522 AIC-6260 ASPI Manager for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.

Host Adapter #:	0	Host Adapter SCSI ID:	7
I/O Port Address:	340	DMA Channel:	0
Interrupt Level:	11	Transfer Mode:	PIO
Disconnection:	Enabled	Parity Checking:	Enabled
Sync Negotiation:	Enabled	LUN Support:	Disabled

Host Adapter #0 - SCSI ID 0 - LUN 0:	QUANTUM	LP105S	910109405	2.8
Host Adapter #0 - SCSI ID 1 - LUN 0:	HP	97544T:	332	9049
Host Adapter #0 - SCSI ID 2 - LUN 0:	IOMEGA	BETA44		1.6
Host Adapter #0 - SCSI ID 6 - LUN 0:	ARCHIVE	VIPER 150	21247	-011

Int 13H active for Drive C: and D:

Int 13H routed through ASPI manager.
ASPI2DOS.SYS Installation Successful

ASPI Disk Driver for DOS
Version 3.0
Copyright 1992 Adaptec, Inc.

HA #0 - SCSI ID 0:0 Handled by Host Adapter BIOS
HA #0 - SCSI ID 1:0 Handled by Host Adapter BIOS
HA #0 - SCSI ID 2:0 Removable Media - 1 logical drive(s) E: reserved

Host Adapter BIOS: 64 head translation
DOS version: 5.0

1 SCSI disk drive(s) handled by ASPIDISK
1 Logical drive(s) installed
ASPIDISK.SYS Installation Successful

Figure 2-6. aspidisk Screen Messages with /d Switch



Chapter Three

Formatting and Partitioning Using *afdisk.exe*

About this Chapter

afdisk.exe is used to partition and format SCSI disk drives which are not under host adapter BIOS control. This chapter describes how to install and use *afdisk.exe*.

Installing *afdisk.exe* on your Hard Disk

Three files are needed when using *afdisk.exe*. They are located on the Distribution diskette and are listed below, along with a short description of their purpose.

<i>afdisk.exe</i>	SCSI disk partition and format utility
<i>afdisk.hlp</i>	<i>afdisk.exe</i> help file
<i>afdisk.cwa</i>	<i>afdisk.exe</i> system file

To install the *afdisk.exe* program onto your hard disk, follow the steps below:

1. Copy the three files listed above onto your hard disk using the DOS copy command. Make sure that all three files are in the same directory.
2. Make sure that *afdisk.exe*, *afdisk.hlp* and *afdisk.cwa* are in the current directory when you run *afdisk.exe*, or that the directory containing these files is located in the search path specified in the path command in your *autoexec.bat* file. See your DOS manual for details regarding the path command.

3. If you altered the path command in *autoexec.bat*, reboot so that it can take effect.

afdisk.exe On-Line Help

After starting *afdisk.exe*, on line help is always available by pressing the **F1** key. Use the **Esc** key to exit help.

Partitioning Your Drive Using *afdisk.exe*

The syntax of the *afdisk.exe* command is:

```
[path]afdisk [/m or /mono] [/?]
```

In general:

- All command line switches are optional.
- All options are preceded by a forward slash.
- Command line options are not case sensitive (either lower or upper case can be used).
- Command line options are not white space sensitive (one or multiple spaces can separate them).

The command line switches operate as follows:

/m or /mono

This switch forces *afdisk* to run in black and white mode. This capability is provided because *afdisk* screens are not displayed properly on some laptop, monochrome VGA and other types of displays.

If the **/m** option does not correct any *afdisk* screen display problem, try executing the DOS mode **bw80** command before running *afdisk*. Remember to issue a DOS mode **co80** command after you are finished with *afdisk* if you have a color monitor.

Example: **/mono**

Display currently supported command line options.

Example: **/?**

/?

To partition a SCSI drive with *afdisk.exe*, follow the steps below:

1. Run *afdisk* using the command line above. After you have invoked *afdisk*, the screen depicted in Figure 3-1 will appear. Note the directions at the bottom of the screen.

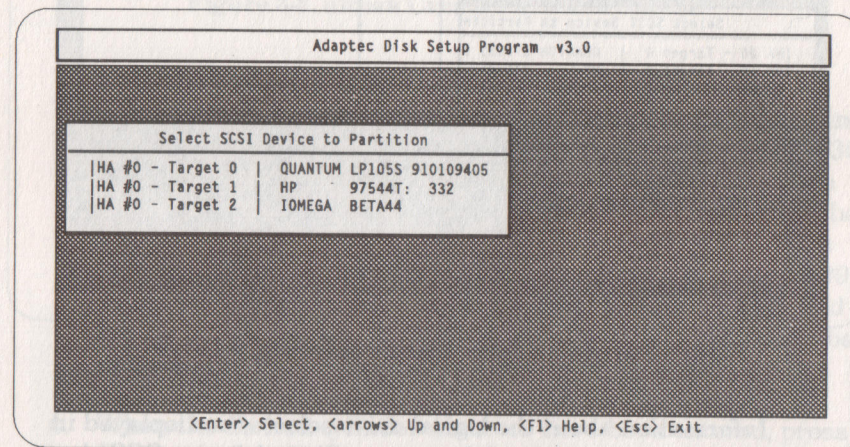


Figure 3-1. Mounted SCSI Drives Found by *afdisk*

The list of drives displayed by *afdisk* includes all installed SCSI disk drives, including any removable media devices and any drives controlled by the host adapter BIOS. Recall that *afdisk* does not let you alter drives controlled by the host adapter BIOS.

The fields on this display are defined as follows:

- HA #** The host adapter number. If your system contains a single host adapter, this number will be zero.
- Target #** The ID number of each SCSI target device on the bus.
- Device ID** The vendor and product ID of each SCSI target device on the bus.

2. Using the cursor keys, select a SCSI disk to partition, and format, then press **Enter**. The screen depicted in Figure 3-2 appears.

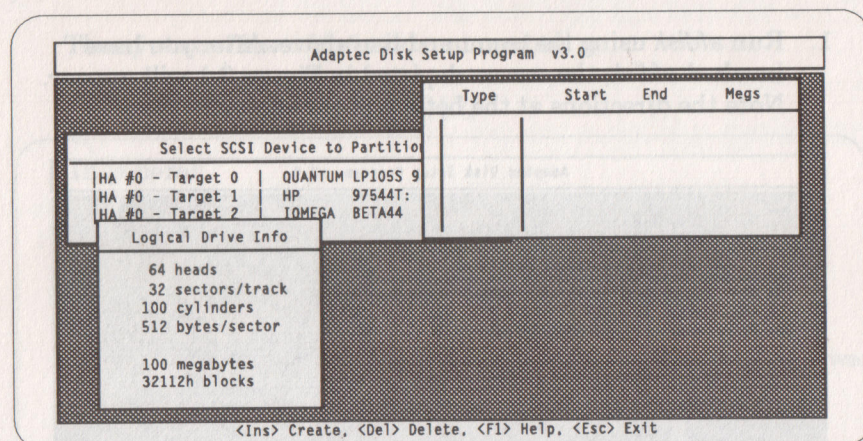


Figure 3-2. afdisk Screen After Selecting a Drive

Information about the logical drive selected is displayed in the lower left corner of the screen. Since Adaptec SCSI host adapters use a 64-head and 32-sector per track translation scheme, the number of cylinders always equals the number of megabytes of available capacity. The number of SCSI logical blocks is also displayed.

Any partitions which currently exist on the drive are displayed on the upper right corner of the screen. Both DOS and non-DOS partitions can be deleted by using the cursor keys, pressing the **Delete** key and answering **yes** to the prompt. In the above example, no partitions exist.

3. To create a new partition, press the **Insert** key. The screen shown in Figure 3-3 appears.

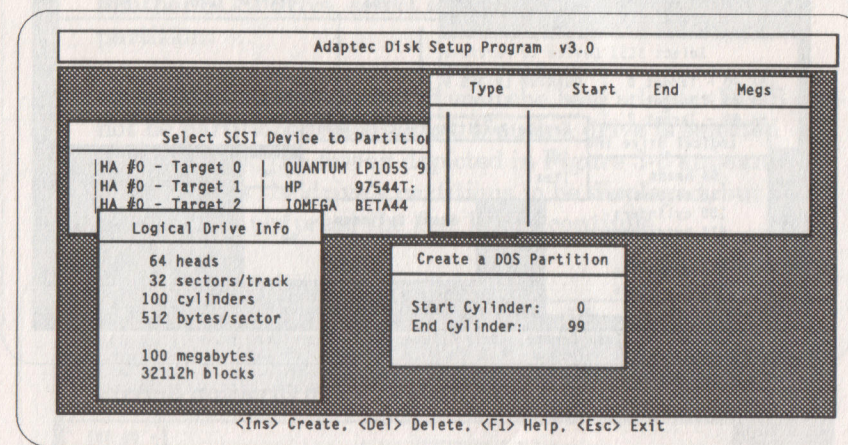


Figure 3-3. afdisk Create Partition Screen

Note the **Create a DOS Partition** window centered in the lower half of the screen. The **Start Cylinder** and **End Cylinder** variables default to their maximum values. For DOS 3.30 this is 32 MBytes per partition. For COMPAQ DOS 3.31 the limit is 512 MBytes per partition. For DOS 4.0x and later, the limit is 1 gigabyte per partition. In this example, DOS 5.0 is used so the **Start Cylinder** is 0 and the **End Cylinder** is 99. These variables can be changed by using the cursor keys and typing in new values. *afdisk* does not allow illegal values to be entered.

4. When the desired cylinder numbers have been entered, press the **Enter** key. The screen depicted in Figure 3-4 appears.

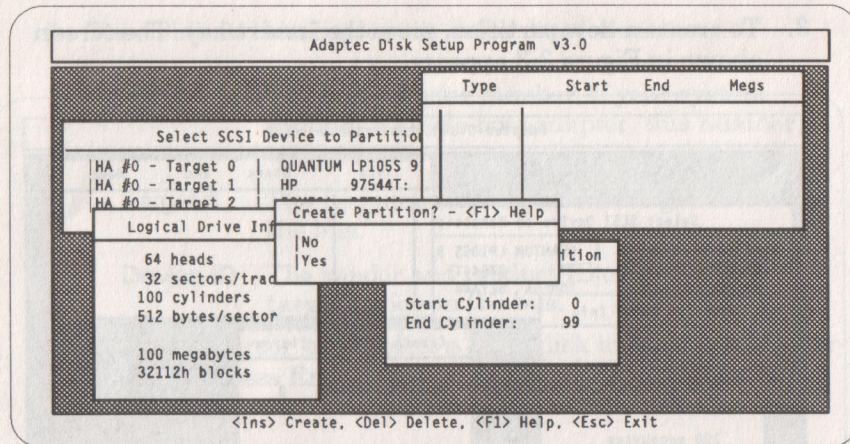


Figure 3-4. afdisk Confirm Partition Creation Screen

5. To complete the process of creating the partition, use the down arrow key to select **yes** and press the **Enter** key. If additional partitions are desired, hit the **Insert** key and repeat the instructions described above.

After each partition has been created, all partitions on the currently selected drive are displayed. This is shown in Figure 3-5.

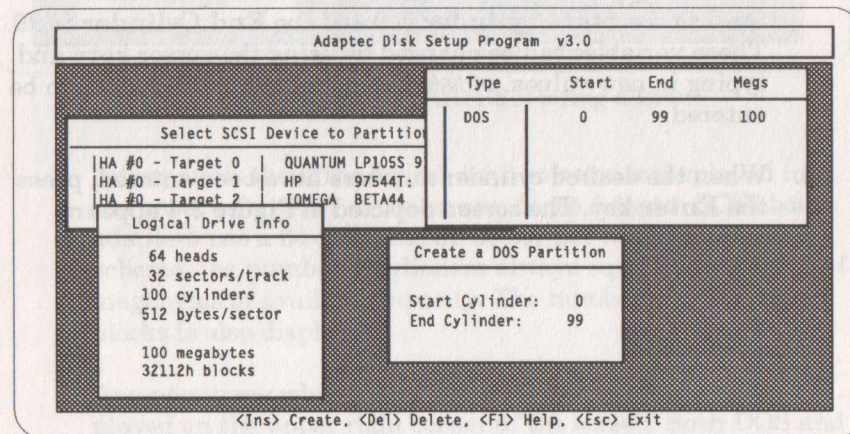


Figure 3-5. afdisk Display Existing Partitions Screen

6. Press the **Esc** key to return to the **Select SCSI Device to Partition** screen. If you wish to create or delete partitions on another SCSI drive, select another valid SCSI drive to partition.

Recall that a drive mounted with the host adapter BIOS cannot be partitioned with *afdisk*. If such a drive is selected within *afdisk*, the screen depicted in Figure 3-6 appears. *afdisk* allows the drive's partitions to be displayed, but not altered. Simply press the **Esc** key to continue.

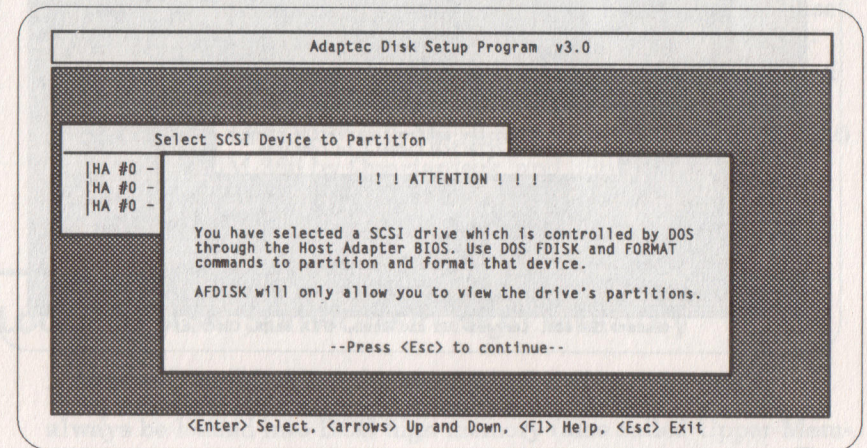


Figure 3-6. afdisk Warning for BIOS-Controlled Drives

7. To quit *afdisk*, press the **Esc** key and select **yes** when prompted on whether or not to quit.

Since partitions are only mounted by DOS at startup, you must reboot the system before you can access newly created partitions. If you have made changes to partitions, the screen in Figure 3-7 is displayed.

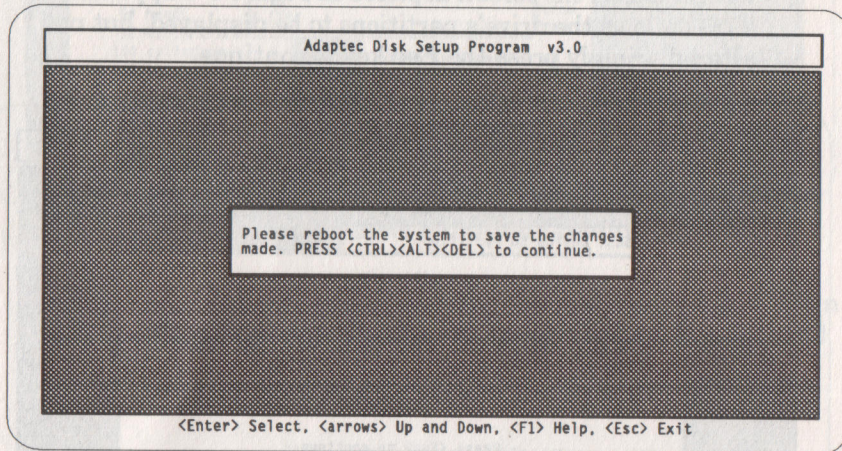


Figure 3-7. afdisk Exit Screen when Partitions Changed



Chapter Four

Software Considerations

About this Chapter

This section describes what you should consider when using Adaptec ASPI software with device drivers or programs that use DOS high memory (between 640 KByte and 1 MByte in the address space), extended memory (above 1 MByte) or the protected mode of the 386™ or 486™ microprocessor. These types of programs include MS-DOS® 5.0, Microsoft® Windows™ (versions 3.0 and 3.1), QEMM-386 by Quarterdeck, and 386Max™ by Qualitas™.

Loading ASPI Software in High Memory

When using MS-DOS 5.0, *aspi2dos.sys* and *aspidisk.sys* can always be loaded into DOS high memory (also called Upper Memory Blocks or UMBs). There are no restrictions.

By loading either or both of these programs into high memory, the amount of conventional memory (below 640 KBytes) on your machine can be maximized.

Sample config.sys which Loads aspi2dos.sys High

The sample *config.sys* file below is used with DOS 5.0 to load *aspi2dos.sys* into high memory. Consult the *MS DOS 5.0 User's Manual* for complete information about the commands listed below:


```
device=\dos\himem.sys
device=\dos\emm386.exe
dos=high,umb
devicehigh=aspi2dos.sys
devicehigh=aspidisk.sys
```

Using ASPI Software with Windows 3.1

Windows 3.1 is supplied with a caching device driver called *smartdrv.exe*. This driver has the ability to double buffer data, meaning that it keeps one buffer in the area between 0 KByte and 640 KByte (for compatibility with older disk drive software) and another buffer with identical contents above 1 MByte. However, when using *aspi2dos.sys*, double buffering is not required.

To ensure that double buffering is not used with *smartdrv.exe*, follow these steps.

1. Check for the line `[path]device=smartdrv.exe /double_buffer` in your *config.sys* file. If it is present, remove the entire line
2. Check for the line `[path]smartdrv.exe /double_buffer` in your *autoexec.bat* file.
3. If this line is present, remove the `/double_buffer` portion of it using an ASCII text editor. After editing, the line will read `[path]smartdrv.exe`. Do not disturb any other command line switches.
4. Reboot your system if you have made changes to *autoexec.bat* or *config.sys* so that any changes can take effect.

□

Chapter Five

Using Multiple Host Adapters

About this Chapter

This chapter explains how to use Adaptec ASPI software with multiple host adapters. It describes the rules you must follow and provides examples of specific system configurations.

Using Multiple Host Adapters

Up to two AHA-1510/1520/1522 Host Adapters can be installed in your system. For each of these you must ensure that:

- A unique I/O port address is used. See *Setting the Port Address...* sections below.
- A different interrupt channel is selected for each host adapter using jumpers on the host adapter.
- If you are using more than one AHA-1520/1522 (which has an on-board BIOS), only one AHA-1520/1522 should have its BIOS enabled. All other host adapter BIOS's should be disabled. See the *Multiple Host Adapters & BIOS Disabling* section below.
- If you are using more than one AHA-1522, the floppy controllers on all the host adapters except the one used are disabled. This can be done with an on-board jumper.

Using Multiple AHA-1510 Host Adapters

For this host adapter, there must be a `device=aspi2dos.sys /pxxx` line in your `config.sys` file for each host adapter installed. Each of these `device=aspi2dos.sys /pxxx` lines must have a different hex value specified for xxx in the `/pxxx` option (that gives the I/O port address at which the host adapter will be found), and the port address specified must match that determined by the jumper on the corresponding AHA-1510. Since this host adapter only supports two port addresses (140h and 340h), only two can be used per system.

Sample config.sys File for Multiple AHA-1510 Host Adapters

Below is the contents of a sample `config.sys` file for a system containing two AHA-1510 host adapters:

```
device = aspi2dos.sys /z
device = aspi2dos.sys /z /p140 /q10
device = aspidisk.sys
```

In this example, the host adapter associated with the first `device=` line above has its I/O port jumpers set for the default value of 340h. The host adapter associated with the second `device=` line above has its I/O port jumpers set for 140h. This latter host adapter also uses interrupt level ten (the `/q10` statement).

Note

Since the AHA-1510 does not contain an on-board BIOS, it is not possible to boot your system from a drive controlled by it.

Using Multiple AHA-1520/1522 Host Adapters

The AHA-1520/1522 has on-board jumpers which can be used to set the port address. With the AHA-1520/1522, `device=aspi2dos.sys /pxxx` lines can also be used in your `config.sys` file. If these lines are used, each must have a different hex value specified for xxx in the `/pxxx` option (I/O port address at which the host adapter will be found) and the jumper setting must match the `/pxxx` setting. Since this host adapter only supports two port addresses (140h and 340h), only two host adapters can be used per system.

Sample config.sys File for Multiple AHA-1520/1522 Host Adapters

Below is the contents of a sample `config.sys` file for a system containing two AHA-1520/1522 host adapters:

```
device = aspi2dos.sys
device = aspi2dos.sys /p140
device = aspidisk.sys
```

In this example, the host adapter associated with the first `device=` line above has its BIOS enabled on the card and its I/O port jumpers set for the default value of 340h. The host adapter associated with the second `device=` line above has its BIOS disabled and its I/O port jumpers set for 140h. If the system will be booted from a host adapter controlled by `aspi2dos.sys`, the `device=` line in `config.sys` for this host adapter must precede that for any other host adapters controlled by `aspi2dos.sys`.

The last line in the sample file above, `device=aspidisk.sys`, should only be used if you need it. See Chapter 1, *Introduction*, for an explanation of when to use `aspidisk.sys`.

Multiple Host Adapters and BIOS Disabling

The AHA-1520/1522 host adapters contain an on-board BIOS. The AHA-1510 does not. Thus this section only applies if you are using multiple AHA-1520/1522 host adapters.

The first *aspi2dos.sys* loaded with a `device=` line in *config.sys* must be associated with the host adapter that has its BIOS enabled. If none of the host adapters have their BIOS's enabled, this will not be a problem. Note that you can disable the BIOS on an AHA-1520/1522 with an on-board jumper. This jumper is labeled BE (for BIOS Enable) on the silkscreen layer. To enable the BIOS, install the jumper; to disable it, remove the jumper.

Using an AHA-1510/1520/1522 and an AHA-1540/1542 Host Adapter

If two SCSI host adapters are in the system, for instance an AHA-1540 and an AHA-1520, and the boot SCSI disk drive is attached to the AHA-1540, then *config.sys* should contain the following two statements:

```
device=aspi4dos.sys
device=aspi2dos.sys
```

Note that the `device=` line for the drive from which you are booting (the AHA-1540 in this case) comes first.

Mixing aspi2dos.sys with Other ASPI Managers

The *aspi2dos.sys* driver is capable of cohabiting with other ASPI drivers in the same system. This means that *aspi2dos.sys* can be mixed with ASPI Managers for other host adapters.

□

Chapter Six

Commonly Asked Questions

About this Chapter

This chapter answers a number of questions which frequently arise when using Adaptec's ASPI software.

- Q. Why should I install the *aspi2dos.sys* manager if I only have one SCSI hard disk installed, and it is currently installed under the BIOS?
- A. When the manager is loaded, Int 13 calls are rerouted through the driver instead of through the host adapter BIOS. Since the Int 13 code is then processed at RAM speed instead of ROM speed, overall system performance is increased.
- Q. I have both *aspi2dos.sys* and *aspidisk.sys* loaded into my *config.sys* file. However, I'm getting the following message during boot: "No SCSI logical drives to support. *aspidisk.sys* is NOT installed". What is wrong?
- A. *aspidisk.sys* will only install if compatible partitions are found on SCSI drives that are not installed under the host adapter BIOS. If such partitions are not found, *aspidisk.sys* will not install. This is normal and is not a problem. *aspi2dos.sys* will still install normally.

Q. What are the DOS partition limits with my SCSI host adapter?

A. The maximum DOS partition size is determined by the DOS version. The table below can be used to determine the maximum partition size:

DOS Version	Maximum Partition Size
MS or IBM 3.30	32 MBytes/partition
COMPAQ 3.31	512 MBytes/partition
MS or IBM 4.0 and newer	1 Gigabyte/partition to a maximum of 1 Gigabyte/drive
MS or IBM 5.0	1 Gigabyte/partition to a maximum of 1 Gigabyte/drive

Q. How do I install a removable media drive?

A. Removable media is supported by *aspi2dos.sys* and *aspidisk.sys*. Use the following guidelines to install removable media:

1. Change the SCSI ID of the removable media drive to 2, 3, 4, 5, or 6. (Consult the drive's manual for instructions.)
2. A low-level format of the media may be necessary. Format utilities are available on the Adaptec Bulletin Board Service (BBS).
3. Place the following lines in your *config.sys* file:

```
device=[path]aspi2dos.sys
device=[path]aspidisk.sys
```

4. Reboot so that the ASPI software is loaded into memory.
5. Partition the media with *afdisk.exe*.
6. Reboot for partitions to take effect.

□

Chapter Seven

Error Messages

About this Chapter

This chapter lists the error messages which may be encountered when using Adaptec's ASPI software. Separate sections are provided for *aspi2dos* and *aspidisk* respectively. Error messages are listed in alphabetical order.

aspi2dos.sys Error Messages

aspi2dos.sys Installation Failed

This error message indicates that the ASPI driver was not loaded. This message will generally be preceded by one of the errors described above.

Driver load aborted by user

This error message indicates that the ASPI driver was not loaded, generally because the user prevented loading by holding both **Shift** keys before driver loading started.

Host adapter at port address xxx failed diagnostics.

The driver diagnostic failed at port address xxx (140h or 340h). This error can occur as a result of any of the following:

- The port address specified by the /p switch does not match the hardware jumpers.
- There is no host adapter present at the specified port address.

- There is an I/O address conflict, in other words the ports used by the host adapter are also used by other board(s) in the system or by the system board itself. The host adapter uses I/O addresses 140h-15Fh for /p140 and I/O addresses 340h-35Fh for /p340.
- The host adapter is faulty.

Invalid entry for '/b' setting

You have entered an invalid /b setting on the command line. The valid entries are: /b and /b-.

Invalid entry for '/c' setting

You have entered an invalid /c setting on the command line. The valid entries are: /c and /c-.

Invalid entry for '/d' setting

You have entered an invalid /d setting on the command line. The valid entry is: /d.

Invalid entry for '/h' setting

You have entered an invalid /hx setting on the command line. There are eight (8) valid host SCSI ID settings: 0, 1, 2, 3, 4, 5, 6, and 7 (e.g., /h7).

Invalid entry for '/i' setting

You have entered an invalid /i setting on the command line. The valid entry is: /i.

Invalid entry for '/L' setting

You have entered an invalid /L setting on the command line. The valid entry is: /L.

Invalid entry for '/p' setting

You have entered an invalid /p setting on the command line. There are two valid port settings: 340h and 140h (e.g., /p140). The factory default setting is 340h.

Invalid entry for '/q' setting

You have entered an invalid /q setting on the command line. There are four (4) valid interrupt request settings: 9, 10, 11, and 12 (e.g., /q11). The factory default value is 11.

Invalid entry for '/u' setting

You have entered an invalid /u setting on the command line. The valid entries are: /u and /u-.

Invalid entry for '/y' setting

You have entered an invalid /y setting on the command line. The valid entries are: /y and /y-.

Invalid entry for '/z' setting

You have entered an invalid /z setting on the command line. The valid entries are: /z and /z-.

Not enough memory available to load driver

This error only occurs with DOS 5.0 and above. This message will only be displayed if the *aspi2dos.sys* driver is being loaded high (devicehigh=) and not enough upper memory is available. Use device= to load the driver into conventional memory.

aspidisk.sys Error Messages

Command line arguments are incorrect.

Check to ensure that any command line switches (/ options) are as specified in this manual. If invalid parameters are used, the driver will not load.

Error issuing SCSI Inquiry command.

This indicates that *aspidisk* timed out on issuing a SCSI Inquiry command. Check SCSI bus termination, SCSI parity, and cabling. The driver will not load if this message is displayed.

Failed to find any SCSI logical drives to support.

The driver cannot find any logical drives to be handled. The drive that is not under control of the host adapter BIOS may not have been formatted.

Failed to read, or invalid, boot record.

This message appears if *aspidisk* was unable to read data from a disk, or if the data read from the disk was invalid. This may occur if the drive has not been partitioned or formatted yet, or is

defective. A low-level format of the drive may fix this problem. The driver continues to load if there are valid attached devices.

Invalid DOS version. DOS must be version 3.21 and above.

aspidisk supports DOS versions 3.21 and later. Versions of DOS older than 3.21 cannot be used. *aspidisk* does not load if this message is displayed.

No SCSI logical drives to support.

This indicates that *aspidisk* has not found any logical drives to support. The driver will not load and take up memory if this message appears. There may be no logical drives to support for several reasons:

- There are no attached SCSI disk drives.
- All SCSI disk drives are under control of the host adapter BIOS.
- The SCSI disk drives have not been partitioned yet.

Unable to open ASPI Manager!

This message indicates that there is not an ASPI Manager loaded. Ensure that the ASPI Manager is specified before *aspidisk* in *config.sys*. Check that the ASPI Manager is loading correctly (it does not load if incorrect command line options are specified).

Unsupported (old-style) ASPI manager found.

aspidisk.sys v3.1 must be used with *aspi2dos.sys* v3.1 or later. Older ASPI Managers are not supported. A free upgrade is available on Adaptec's BBS.

WARNING: Maximum number of DOS logical drives (A: to Z:) reached.

Only 24 logical drive letters are available for hard disk logical drives, whether they are SCSI or standard hard disk drives. If 24 logical drives are exceeded, only a maximum of 24 logical drives (C: to Z:) are available for hard disk drives.

□

Appendix A

Glossary

Glossary of Terms

AHA-1540

Adaptec host adapter for connecting SCSI devices to the PC-AT backplane bus. The AHA-1740A/1742A/1744 is an enhancement of the AHA-1540.

AHA-1540B

The enhanced high-performance Adaptec host adapter for connecting SCSI devices to the PC-AT backplane bus.

AHA-1542B

The enhanced high-performance Adaptec host adapter for connecting SCSI devices and standard IBM-compatible floppy disk devices to the PC-AT backplane bus.

AHA-1740A/1742A/1744

Either the AHA-1740A/1742A or the AHA-1744 or both.

ASPI

Advanced SCSI Programming Interface. A software architecture which permits device modules to migrate across different hardware by communicating with the hardware through a passthrough interface to a manager written to the specific hardware.

Asynchronous Data Transfer

Data transfer performed by the SCSI interface involving the interlocking of a signal to the initiator (REQ) and a signal to the target (ACK) such that each step of the data transfer protocol must occur before the next step can begin. Characterized by a low data rate and independence of external timing constraints, including cable length and circuit response times.

AT Bus

The Industry Standard Architecture bus.

Bus Device Reset

A SCSI message that clears all activity in the target to which it is addressed.

Byte

An eight-bit unit of data. An octet. A byte is normally the smallest addressable unit of a memory and the unit of transfer on the SCSI.

CCS

See Common Command Set

Common Command Set

A defacto standard SCSI command set for communication with hard disk drives. The Common Command Set (CCS) is the basis for the SCSI-2 command set for all types of peripheral devices.

Configuration

The operation of configuring a device on the EISA bus through access of registers in the device by the host. It replaces the method of using jumpers common on ISA bus devices.

Control Microprocessor

An integrated circuit computer used to execute the software that controls the host adapter's operation.

Device Driver

A program that is linked with, or attached to, an operating system to map the software interface of the operating system to the requirements of attached peripheral devices and host adapters. Under ASPI, the main component associated with the board is known as a Manager.

DMA

See Direct Memory Access

Direct Memory Access

A mechanism that allows hardware control of the transfer of streams of data to or from the main memory of a computing system. The mechanism may require setup by the host software. After initialization, it automatically sequences the required data transfer and provides the necessary address information.

EISA

Extended Industry Standard Architecture. A superset standard of the 8- and 16-bit ISA standard which allows 32 bits of data to be transferred across the bus at up to 33 MBytes/second.

Enhanced Mode

The operation mode of the AHA-1740A/1742A/1744 to take full advantage of the addressing range and register set available under EISA. It is not compatible with earlier revisions of ASPI managers and drivers.

EEPROM

Electrically-Erasable Programmable Read Only Memory. An integrated circuit used to store the host adapter firmware, which allows both mode download and firmware upgrade while in-circuit.

EPROM

Erasable Programmable Read Only Memory. An integrated circuit used to store the host adapter BIOS.

Firmware

The software that controls and manages the host adapter. It is *firm* as opposed to *soft* because it is designed into the host adapter and cannot be modified by the user.

Host

A microcomputer in which a host adapter is installed. The host uses software to request the services of the host adapter in transferring information to and from peripheral devices attached to the SCSI bus connector of the host adapter.

Host Adapter

A hardware printed circuit board that installs in a standard microcomputer backplane and provides a SCSI bus connection so

that SCSI devices can be connected to the microcomputer. A host adapter is *intelligent* if it has a simple high-level software interface to the microcomputer. A host adapter is *dumb* if the microcomputer must directly manage the SCSI protocol using the microcomputer processor.

IBM PC-AT Compatible

Any computer system that emulates exactly the IBM PC-AT and that uses an ISA backplane bus.

Industry Standard Architecture

The IBM PC-AT functions have been duplicated by a number of manufacturers. All the IBM PC-AT compatible machines use a backplane bus that very closely emulates the function of the backplane bus of the PC-AT. Because of the broad usage of this bus structure, it has become known as the Industry Standard Architecture bus, even though there is no presently accepted standard for the bus.

Initiator

A SCSI device that requests an operation to be performed by another SCSI device (the target). The initiator provides all the command information and parameters required to perform the operation, but the details of the operation are actually sequenced by the target.

ISA

See Industry Standard Architecture

Logical Unit

A physical or virtual device addressed through a target.

Logical Unit Number

An encoded three-bit identifier for a logical unit.

LU

See Logical Unit

LUN

See Logical Unit Number

Manager

The component of a driver which is specific to a particular board architecture and presents a standard ASPI pass-through interface for use by the peripheral-specific component of the driver, known as a module.

Multitasking Operation

The execution of commands in such a way that more than one command is in progress at the same time, allowing the system to take advantage of overlapping activities by using resources that are temporarily not required for other operations. More than one program or more than one portion of a program may be operating in parallel.

PC-AT

A family of small computers sold by IBM, also called the Personal Computer/AT family of computers. The name is trademarked by IBM.

RAM

Random Access Memory. Memory of which any byte can be accessed directly in a single memory cycle. Information can be read from and written to the memory.

ROM

Read-Only Memory. Memory in which any byte can be read but not written.

SCSI

Small Computer System Interface.

SCSI Device

A device attached to a Small Computer System Interface bus cable. The device may be an initiator, a target, or capable of both types of operation. The device may be a peripheral device, a host device, or a device mixing both roles.

Single-Ended

A term referring to the electrical characteristics of the signals used on the SCSI bus interface. Single-ended signals occupy a single conductor and are references to a common ground carried on the cable between the SCSI components attached.

Single-Threaded Operation

Operation of the computing system such that only one program can be operating or active at a time. The computing system must wait until all resources are available before starting an operation and cannot start another operation until the first one is completed. No overlapping of latencies or program operation occurs.

Standard Mode

The operation mode of the AHA-1740A/1742A/1744 to allow software drivers written for the AHA-1540/1640 family to operate fully on the board. This has no performance limitations but does not allow addressing beyond 16 MBytes nor access to several EISA registers.

Sync Data Transfer Negotiation

The message exchange between the initiator and the target that allows the negotiation of the data transfer frequency and delay between requests and acknowledgments required for synchronous data transfer. Once negotiated, synchronous data transfer parameters remain unchanged until certain reinitialization activities occur.

Synchronous Data Transfer

A method of data transfer on the SCSI bus involving clocking data on to the bus with a fixed-length fixed-frequency strobe pulses. The acknowledgments may be delayed several clock periods from the data requests. Synchronous data transfer can be used only for data transmission on the SCSI bus. It is prohibited for command, message, and status transmission.

Target

A SCSI device that performs an operation requested by an initiator. The target may be a peripheral device performing a service for an initiator. The target may also be a host adapter performing a processor-type device service for an initiator.

Word

A 2-byte (16-bit) unit of data.



Index

386MAX 4-1

A

afdisk.exe

explained 1-4
installing under DOS 3-1
with monochrome monitors 3-2
on-line help 3-2
when to use 3-1, 3-3, 3-5, 3-7

ASPI

architecture 1-5
defined A-1
explained 1-5

ASPI DOS Manager

when to use 1-2

aspi2dos.sys

command line options 2-4
error messages 7-1
explained 1-2
installing under DOS 2-1
loading into high memory 4-1
mixing with other ASPI managers 5-4
on-screen messages 2-2
suppressing loading into memory 2-3
when to use 1-2

aspi4dos.sys

5-4

aspidisk.sys

command line options 2-11
error messages 7-3
explained 1-3
installing under DOS 2-10
loading into high memory 4-1
loading problems 6-1
on-screen messages 2-13
for removable media 1-3
when it loads in memory 1-4
when to use 1-2

asynchronous data transfer	
defined	A-1
autoexec.bat	
path command for afdisk.exe	3-1

B

BIOS, host adapter	
absence on AHA-1510	1-3
control of removable media drives	1-3
disabling with multiple host adapters	5-4
interaction with afdisk.exe	1-4
interaction with aspidisk.sys	1-3
number of SCSI disks it can control	1-2
rerouting Int 13	2-8
SCSI IDs it must use	1-3
bootable SCSI disk	1-5
BSY, SCSI	
command line option to manage	2-8

C

CD ROM	1-3
command line options	
aspi2dos.sys	2-4
aspi2dos.sys Group 1	2-5
aspi2dos.sys Group 1, setting default value for	2-7
aspi2dos.sys Group 2	2-7
aspidisk.sys	2-11
common command set	
defined	A-2
commonly asked questions	6-1
config.sys	1-4, 2-1 - 2-2, 2-10, 4-1
with multiple AHA-1510 host adapters	5-2 - 5-4
sample file	5-2 - 5-4
contents	
distribution diskette	1-2
package	1-1

D

device driver	
defined	A-2

device drivers	1-6
disconnect SCSI	
command line option to prevent	2-5
disk	
SCSI bootable	1-5
disk caching drivers	2-2
disk sectors	
size supported	1-3
distribution diskette	1-2, 2-1
DOS	
installing afdisk.exe under	3-1
installing aspi2dos.sys under	2-1
installing aspidisk.sys under	2-10

E

enhanced mode	
defined	A-3
error messages	
aspi2dos.sys	7-1
aspidisk.sys	7-3
extended memory, loading into	4-1

F

formatting and partitioning	
using afdisk.exe	1-4
explained	1-4

H

high memory, loading into	4-1
host adapter	
defined	A-3
host adapters	
multiple	5-1

I

ID, SCSI	
command line option to specify	2-5
values used by host adapter BIOS	1-3

initiator	
defined	A-4
Inquiry command	7-3
installing	
afdisk.exe under DOS	3-1
aspi2dos.sys under DOS	2-1
aspidisk.sys under DOS	2-10
software	2-1, 2-3, 2-5, 2-7, 2-9, 2-11, 2-13
interrupt request	
command line option to specify	2-5

L

logical drives, maximum	7-4
logical unit	
defined	A-4

M

manager	
defined	A-5
multiple AHA-1510 host adapters	
config.sys content	5-2
multiple AHA-1520/1522 host adapters	
config.sys content	5-3
multiple host adapters	
how to use	5-1, 5-3

O

on-screen messages	
aspi2dos.sys	2-2
aspidisk.sys	2-13

P

partition mounting	
using afdisk.exe	1-3, 1-5
using fdisk.exe	1-3, 1-5
partition size, maximum	6-2
partitioning	
using afdisk.exe	3-4 - 3-5, 3-7
plotters	1-3

port address	
I/O	5-2 - 5-3
setting	2-9
printers	1-3
protected mode (386)	4-1

Q

QEMM-386	4-1
----------	-----

R

removable media	1-3
installation	6-2
reserving logical drives	2-12
SCSI ID	6-2
using	1-4
reserved count setting (DOS logical drives)	2-12

S

SCSI	
defined	A-5
SCSI BSY	
command line option to manage	2-7
SCSI disconnect	
command line option to permit	2-5
SCSI ID	1-3
command line option to specify	2-5
removable media	6-2
SCSI parity	
command line option to disable	2-6
command line option to enable	2-6
SCSI synchronous negotiation	
command line option to initiate	2-6
command line option to suppress	2-6
sectors	
size supported	1-3
single-ended	
defined	A-5
single-threaded operation	
defined	A-6
smartdrv.exe	2-2

smartdrv.sys	2-2
software	
installing	2-1, 2-3, 2-5, 2-7, 2-9, 2-11, 2-13
standard mode	
defined	A-6
sync data transfer negotiation	
defined	A-6
synchronous data transfer	
defined	A-6

T

tape drives	1-3
target	
defined	A-6
technical support	iii

U

upper memory blocks (UMBs)	4-1
--------------------------------------	-----

W

Windows 3.1	
using ASPI with	4-2



adaptec

691 south milpitas blvd. • milpitas, ca 95035 • (408)945-8600

Printed in Singapore

STOCK NO.: 510335-00

Rev. A

GM 8/92

adaptec

Software License Agreement

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE OPENING THIS PACKAGE. BY OPENING THIS PACKAGE, YOU ARE AGREEING TO BE BOUND BY THESE TERMS AND CONDITIONS WITH REGARD TO THE ADAPTEC SOFTWARE ("Software") ENCLOSED HEREIN. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, YOU SHOULD PROMPTLY RETURN THE PACKAGE UNOPENED AND YOUR MONEY WILL BE REFUNDED.

LICENSE

1 License: This Agreement grants you, the Licensee, a license to:

- (a) use the Software on a single computer system which incorporates an Adaptec host adapter, or, in the case of a multi-user or networked system which permits access to the Software by more than one user at the same time, at a single working location.
- (b) make one copy of the Software in machine readable form solely for back-up purposes provided you reproduce Adaptec's copyright notice and any proprietary legends.

2. Restrictions: You may not distribute copies of the Software to others or electronically transfer the Software from one computer to another over a network. You may not use the Software from multiple locations of a multi-user or networked system at the same time. The Software contains trade secrets and in order to protect them you may not decompile, reverse engineer, disassemble, or otherwise reduce the Software to a human-perceivable form. YOU MAY NOT MODIFY, ADAPT, TRANSLATE, RENT, LEASE, LOAN, RESELL FOR PROFIT, DISTRIBUTE, NETWORK, OR CREATE DERIVATIVE WORKS BASED UPON THE SOFTWARE OR ANY PART THEREOF.

3. Ownership of Software: As Licensee, you own the media upon which the Software is recorded or fixed, but Adaptec retains title and ownership of the Software recorded on the original media and all subsequent copies of the Software regardless of the form or media in which or on which the original and other copies may exist. This license is not a sale of the Software or any copy.

4. Confidentiality: You agree to maintain the Software in confidence and to not disclose the Software to any third party without the express written consent of Adaptec. You further agree to take all reasonable precautions to preclude access of unauthorized persons to the Software.

5. Termination: This license is effective until terminated. This license will terminate automatically without notice if you fail to comply with any provision hereof. Upon termination you shall destroy the written materials and all copies of the Software, including modified copies, if any.

6. Limited Warranty: Adaptec warrants only that the media upon which the Software is furnished will be free from defects in material or workmanship under normal use and service for a period of thirty (30) days from the date of delivery to you. ADAPTEC MAKES NO OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND DOES NOT WARRANT THAT THE SOFTWARE WILL BE MERCHANTABLE OR FIT FOR ANY PARTICULAR PURPOSE.

7. Patents, Copyrights: ADAPTEC MAKES NO OTHER WARRANTY, EXPRESS, IMPLIED OR STATUTORY, THAT THE SOFTWARE OR ITS USE IS OR SHALL BE FREE FROM CLAIMS OF INFRINGEMENT OF PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES.

8. Limitation of Damages: ADAPTEC SHALL NOT BE LIABLE FOR INDIRECT, SPECIAL OR INCIDENTAL EXPENSES OF ANY KIND ARISING UNDER THIS AGREEMENT OR FROM YOUR USE OF THE SOFTWARE.

9. Limitation of Remedies: Adaptec's entire liability and your exclusive remedy shall be:

- (a) the replacement of any media not meeting Adaptec's limited warranty which is returned to Adaptec; or
- (b) if Adaptec or its distributor is unable to deliver replacement media which is free of defects in materials or workmanship, you may terminate this Agreement by returning the Software and your money will be refunded.

10. General: This is the only Agreement between you and Adaptec relating to this Software. This Agreement shall be governed by California law except as to copyright matters which are covered by Federal law. This Agreement is deemed entered into at Milpitas, California by both parties. Should any provision of this Agreement be declared unenforceable in any jurisdiction, then such provision shall be deemed to be severable from this Agreement and shall not affect the remainder hereof. All rights in the Software not specifically granted in this Agreement are reserved by Adaptec.